

Main Exercises Week 11

MATH 130: Calculus I, Section 4

Your Name (Print): _____

Follow the general guidelines for the Main Exercises assignments (the salmon colored handout). Be sure to **staple** together your pages if you have more than one, and include your **name** at the top. Neatness is appreciated, makes a good first impression, and can earn you a bonus point!!!

This homework is particularly focused on material in Sections 3.11-4.1.

Due: at the beginning of class on Friday, April 7th

Remember: Your write-up should be **your own**. You may discuss these problems with others, but **you should be alone when you write them up**, using only outlines of any group or Intern discussions. **EXPLAIN** and **SHOW YOUR WORK!!!** Final answers will not receive full credit without supportive explanations.

1. A plane flies horizontally at an altitude of 5km and passes directly over a tracking telescope on the ground. When the angle of elevation is $\frac{\pi}{3}$, this angle is decreasing at a rate of $\frac{\pi}{6}$ rad/min. How fast is the plane traveling at that time? Your solution should include ALL steps of the process as we discussed. Also, use exact values not estimates (anything in decimal will likely be an estimate!).

2. Find the absolute minimum and maximum values of f on the interval $[-1, 1]$ if $f(x) = \ln(x^2 + x + 1)$. Be sure to show all your work and make clear that you have checked all possibilities (for example, in general there are two possibilities for where a critical point can occur; show that you have checked both). Also, use exact values not estimates (anything in decimal will likely be an estimate!).